

Amendments to the Claims:

Please amend the claims as follows:

Please cancel claims 21-88 and 92. Please add claims 93-141.

1. (Currently Amended) A heavy duty rotary concrete mixing drum capable of attachment to a vehicle; the drum comprising a first end which engages a vehicle powered drive assembly which rotates said drum for mixing of said concrete and a second end from which mixed concrete is discharged; wherein said drum is manufactured from at least one layer of plastics material; wherein the drum includes a wall having integral internal formations promote mixing and discharge of said concrete and inner an surface which promotes mixing of the concrete.

2. (Original) A heavy duty rotary concrete mixing drum according to claim 1 wherein the drum comprises an inner layer of elastomeric material and an external structural layer.

3. (Currently Amended) A heavy duty rotary concrete mixing drum according to claim 2 wherein said ~~internal~~ inner layer includes a polyurethane elastomer.

4. (Previously Presented) A heavy duty rotary concrete mixing drum according to claim 2 wherein said external structural layer includes a fiber reinforced composite exterior.

5. (Currently Amended) A heavy duty rotary concrete mixing drum according to claim 4 wherein the wall of the drum includes fiberglass filament windings applied about said drum outside said inner ~~polyurethane~~ layer.

6. (Original) A heavy duty rotary concrete mixing drum according to claim 5 wherein said wall includes between said inner layer and said outer structural layer a bonding layer.

7. (Previously Presented) A heavy duty rotary concrete mixing drum according to claim 1 wherein said integral internal formations comprise helical blades extending from said inner layer.

8. (Original) A heavy duty rotary concrete mixing drum according to claim 7 wherein said integral helical blades have a variable pitch dimension of between 0.5-2 meters.

9. (Previously Presented) A heavy duty rotary concrete mixing drum according to claim 2 wherein the strength of the structural layer of said drum is around 600 Mpa at a drum wall thickness of approximately 8mm.

10. (Currently Amended) A heavy duty rotary concrete mixing drum according to claim 9 wherein said ~~polyurethane~~ at least one layer of plastics material is approximately 2-8mm thick and said fiberglass filament windings are formed from a layer of approximately 2-8mm thickness.

11. (Previously Presented) A heavy duty rotary concrete mixing drum according to claim 3 wherein an inner surface of the polyurethane drum provides wear resistance and promotes mixing of the contents of the concrete at the concrete/wall boundary layer.

12. (Previously Presented) A heavy duty rotary concrete mixing drum according to claim 6 wherein the weight of the drum is such that when full, the total weight of the plastics drum and contents is lighter than a steel drum of an equivalent size when full.

13. (Previously Presented) A heavy duty rotary concrete mixing drum according to claim 7 wherein said blades are formed by said elastomeric material and define a hollow internal cavity in each helical blade.

14. (Currently Amended) A heavy duty rotary concrete mixing drum according to claim 13 wherein said helical blades include a bonding layer adjacent said inner ~~polyurethane~~ layer and a structural layer adjacent said bonding layer.

15. (Original) A heavy duty rotary concrete mixing drum according to claim 14 wherein said helical blades include a fibre reinforced tension member disposed in said cavity outside said structural layer and along the length of the blade.

16. (Currently Amended) ~~A heavy duty rotary concrete mixing drum according to claim 1 wherein the drum is manufactured in three sections from three separate molds, the first of said sections forming an end which engages said drive assembly for mixing said drum, the second said sections including said opening for discharge of said concrete from said drum and the third of said sections providing an intermediate junction between the first and second parts.~~ A heavy duty rotary concrete mixing drum according to claim 7 wherein said solid core blades further include embedded therein a continuous glass fibre reinforced elastomer disposed along the length of said blade.

17. (Currently Amended) ~~A heavy duty rotary concrete mixing drum for mounting on a vehicle; the drum comprising an opening at one end for discharging concrete mixed in said drum, and at the other end means for engaging a drive assembly which rotates the drum for mixing and discharging concrete; wherein, the drum includes a wall manufactured using at least one base mold from layers of plastic materials; wherein the drum further includes blades integrally attached which outstand from an internal surface of the wall of the drum and form an archimedian screw disposed such that when the drum is rotated in a first direction the concrete contents are mixed and when the drum is rotated in a second direction the concrete is discharged from said drum; and wherein the internal surface of the drum is formed from a elastomer which promotes mixing of the concrete at the concrete/drum boundary layer, and wherein, the total weight of the drum and contents when full is lighter than for a steel drum of an equivalent volume when full.~~ A heavy duty rotary concrete mixing drum according to claim 2 wherein said layers are coloured as wear indicators.

18. (Currently Amended) A heavy duty rotary concrete mixing drum ~~having an opening at one end for discharge therefrom and at the other end means for engaging a drive assembly so as to rotate the drum for mixing and discharge of concrete according to claim 1~~ wherein the drum includes a wall manufactured from layers of plastics material using three base moulds and further includes detachable or integrally attached blades which outstand from an inner surface of said wall; the vans forming an archimedian spiral disposed such that when the drum is rotated in a first direction the concrete contents are mixed and when the drum is rotated in a second direction, the concrete is discharged from said drum;

and wherein the internal surface of the drum includes a polyurethane elastomer layer which promotes mixing of the contents of the concrete at the concrete boundary layer, and wherein the weight of the drum is such that when full, the total weight of the drum and contents is lighter than for a steel drum of an equivalent size when full.

19. (Currently Amended) A heavy duty rotary concrete mixing drum according to claim ~~18~~ 1 wherein the drum is ~~manufactured in three separate parts from said three separate molds, the first of said parts forming an end which engaged said drive assembly, the second said parts including the opening for discharge of said concrete from said drum and the third of said parts providing an intermediate junction between the first and second parts.~~ pear-shaped and includes a first tapering end portion having an end configured to engage the drive assembly, a second opposite tapering end portion including an opening for discharge of said concrete from said drum and a third intermediate portion extending between the first tapering end portion and the second tapering end portion.

20. (Currently Amended) A heavy duty rotary concrete mixing drum according to claim ~~1 to 13 and 16 to 17~~ 19 wherein the wall of said drum includes an inner layer of elastomer, an intermediate chemical bonding layer and an exterior layer of a composite of resin and high strength wound fibre reinforcement.

21-88 Cancel.

89. (Original) A drum according to claim 2 wherein said layers are colored as wear indicators.

90. (Previously Presented) A heavy duty rotary concrete mixing drum according to claim 7 wherein said blades are solid core along the full length of the blades.

91. (Previously Presented) A heavy duty rotary concrete mixing drum according to claim 90 wherein said solid core blades further include embedded therein a continuous glass fibre reinforced elastomer disposed along the length of said blade.

92. Cancel.

93. (New) A heavy duty rotary concrete mixing drum according to claim 1 wherein the internal formations radially project toward an axial centerline of the drum and wherein the internal formations have a radial midportion formed entirely from one or more layers of substantially non-metallic materials.

94. (New) The heavy duty rotary concrete mixing drum of claim 1 wherein at least a portion of the internal formations has a pitch of 2 meters.

95. (New) The heavy duty rotary concrete mixing drum of claim 1 wherein the internal formations have a root having a radius greater than 10 millimeters.

96. (New) The heavy duty rotary concrete mixing drum of claim 1 wherein the internal formations have a root, a tip opposite the root and a midportion between the root and the tip having a first thickness, wherein the tip has a second thickness greater than the first thickness.

97. (New) The heavy duty rotary concrete mixing drum of claim 96 wherein the tip includes an embedded reinforcement member.

98. (New) The heavy duty rotary concrete mixing drum of claim 96 wherein the tip includes an embedded reinforcement member.

99. (New) The heavy duty rotary concrete mixing drum of claim 98 wherein the reinforcement member continuously extends as a single unitary body from a first axial end of the drum across an axial midpoint of the drum.

100. (New) The heavy duty rotary concrete mixing drum of claim 99 wherein the reinforcement member continuously extends as a single unitary body proximate to a second axial end of the drum.

101. (New) The heavy duty rotary concrete drum of claim 1 wherein the internal formations continuously extend as a single unitary body from a first axial end of the drum across an axial midpoint of the drum.

102. (New) The heavy duty rotary concrete mixing drum of claim 1 including:

a first layer of polymeric material providing at least a portion of the inner surface of the drum; and

a second layer external to the first layer, wherein the second layer continuously extends as a single unitary body from a first axial end of the drum across an axial midpoint of the drum.

103. (New) The heavy duty rotary concrete mixing drum of claim 102 wherein the second layer continuously extends as a single unitary body from the first axial end of the drum to a second axial end of the drum.

104. (New) The heavy duty rotary concrete mixing drum of claim 102 wherein the second layer includes reinforced fibers.

105. (New) The heavy duty rotary concrete mixing drum of claim 102 wherein at least a portion of the first layer continuously extends as a single unitary body from the first axial end of the drum across the axial midpoint of the drum.

106. (New) The rotary concrete mixing drum of claim 105 wherein the first layer continuously extends as a single unitary body from the first axial end of the drum proximate to the second axial end of the drum.

107. (New) The heavy duty rotary concrete mixing drum of claim 1 wherein the radial midportion has a thickness provided by a single homogenous material.

108. (New) The heavy duty rotary concrete mixing drum of claim 107 wherein a single homogenous material is a urethane-based material.

109. (New) The heavy duty rotary concrete mixing drum of claim 1 wherein the radial midportion is configured to deflect into a sail-shaped surface cupped to contain concrete when experiencing concrete loading.

110. (New) The heavy duty rotary concrete mixing drum of claim 109 including a rigid tension member along a radial end portion of the internal formations.

111. (New) The heavy duty rotary concrete mixing drum of claim 1 wherein the drum is pear-shaped and omits internal and external seams circumferentially extending about the axial center line of the drum.

112. (New) The heavy duty rotary concrete mixing drum of claim 1 including a track ring formed from fiber reinforced plastic.

113. (New) A heavy duty rotary concrete mixing drum having a first axial end and a second axial end, the drum comprising:

a first layer of at least one polymeric material forming at least a portion of an interior surface of the drum;

a second layer external to the first layer, wherein the second layer continuously extends as a single unitary body from the first axial end of the drum across an axial midpoint of the drum; and

a spiral mixing blade extending along the interior surface of the drum.

114. (New) The drum of claim 113 wherein the second layer continuously extends as a single unitary body from the first axial end to proximate a second axial end of the drum.

115. (New) The drum of any one of claim 113 wherein the first layer continuously extends as a single unitary body from one of the first axial end and the second axial end across the axial midpoint of the drum.

116. (New) The drum of claim 115 wherein the first layer continuously extends as a single unitary body to proximate the other of the first axial end and the second axial end.

117. (New) The drum of claim 113 wherein the second layer comprises fiber-reinforced polymeric material.

118. (New) The drum of claim 117 wherein the first layer includes urethane-based material.

119. (New) The drum of claim 113 wherein the spiral mixing blade is integrally formed as part of a single unitary body with the first layer.

120. (New) The drum of claim 113 wherein at least a portion of the spiral mixing blade has a pitch of about 2.0 meters.

121. (New) The drum of claim 113 wherein at least a portion of the spiral mixing blade continuously extends as a single unitary body from one of the first axial end and the second axial across an axial midpoint of the drum.

122. (New) The drum of claim 121 wherein at least a portion of the spiral mixing blade continuously extends proximate to the other of the first axial and the second axial end.

123. (New) The drum of claim 113 wherein the spiral mixing blade has a root, a tip and a midportion between the root and the tip, wherein at least a portion of the midportion is formed entirely from one or more layers of substantially non-metallic materials.

124. (New) The drum of claim 113 wherein the spiral mixing blade has a root, a tip and a midportion between the root and the tip and wherein the midportion has a thickness formed by a single homogenous polymeric material.

125. (New) The drum of claim 124 wherein the single homogenous polymeric material is a urethane-based material.

126. (New) The drum of claim 113 wherein the spiral mixing blade includes a reinforcement member.

127. (New) The drum of claim 126 wherein the spiral mixing blade has a tip and wherein the reinforcement member extends along the tip.

128. (New) The drum of claim 126 wherein the reinforcement member continuously extends as a single unitary body from one of the first axial end and the second axial end across an axial midpoint of the drum.

129. (New) The drum of claim 128 wherein the reinforcement member continuously extends as a single unitary body to proximate the other of the first axial end and the second axial end of the drum.

130. (New) The drum of claim 113 wherein the spiral mixing blade includes a root, a tip and a midportion between the root and the tip, wherein the midportion is flexible so as to deflect into a sail-shaped surface cupped to contain concrete when experiencing concrete loading.

131. (New) The drum of claim 113 wherein the drum omits external and internal seams circumferentially extending about an axial center line of the drum.

132. (New) The drum of claim 113 wherein the spiral mixing blade is integrally formed as part of a single unitary body with the first layer, wherein the spiral mixing blade has a root, a tip and a midportion between the root and the tip and wherein the midportion has a thickness provided by a single homogenous polymeric material.

133. (New) The drum of claim 132 wherein the single homogenous polymeric material is a urethane-based material.

134. (New) A heavy duty rotary concrete mixing drum, the drum comprising:

a first non-metallic layer at least partially forming an interior of the drum; and

a helical mixing blade along the interior of the drum, wherein at least a portion of the blade is integrally formed as part of a single unitary body with the first layer, the blade having a root, a tip opposite the root and a midportion between the root and the tip, wherein

the midportion has a larger degree of flexibility than the root and the tip such that the midportion deforms into a sail-shaped surface cupped to contain concrete when experiencing concrete loading.

135. (New) The drum of claim 134 wherein the tip includes an embedded reinforcement member.

136. (New) The drum of claim 134 wherein the root has a radius greater than 10 mm.

137. (New) The drum of claim 134 wherein at least a portion of the blade has a pitch of about 2 meters.

138. (New) The drum of claim 134 wherein the midportion is formed from a single homogenous polymeric material.

139. (New) The drum of claim 138 wherein the single homogenous polymeric material is a urethane-based material.

140. (New) The drum of claim 134 wherein the midportion is formed entirely from one or more layers of substantially non-metallic materials.

141. (New) The drum of claim 134 wherein the midportion has a first thickness and wherein the tip has a second thickness greater than the first thickness.